

**KNOWLEDGE ON DISCHARGE INFORMATION AMONG PATIENTS
WITH HYPERTENSIVE DISORDERS IN PREGNANCY AT
MUHIMBILI NATIONAL HOSPITAL**

Fatemazahra Salim Amiji, MD

**MMed (Obstetrics and Gynaecology) Dissertation
Muhimbili University of Health and Allied Sciences
October, 2021**

**Muhimbili University of Health and Allied Sciences
Department of Obstetrics and Gynecology**



**KNOWLEDGE ON DISCHARGE INFORMATION AMONG PATIENTS
WITH HYPERTENSIVE DISORDERS IN PREGNANCY AT
MUHIMBILI NATIONAL HOSPITAL**

By

Fatemazahra Salim Amiji

**A Dissertation Submitted in (Partial) Fulfillment of the Requirements for the Degree
of Master of Medicine (Obstetrics and Gynaecology) of**

**Muhimbili University of Health and Allied Sciences
October, 2021**

CERTIFICATION

The undersigned certifies that she has read and hereby recommends for acceptance by Muhimbili University of Health and Allied Sciences a dissertation titled; “**Knowledge on discharge information among patients with Hypertensive Disorders in Pregnancy at Muhimbili National Hospital**”, in (partial) fulfillment of the requirements for the degree of master’s in medicine (Obstetrics and Gynecology) of Muhimbili University of Health and Allied Sciences.

Dr. Sabria Rashid, MD, MMed

(Supervisor)

Date

DECLARATION AND COPYRIGHT

I, **Dr. Fatemazahra Salim Amiji**, declare that this **dissertation** is my own original work and that it has not been presented and will not be presented to any other University for a similar or any other degree award.

Signature.....

Date.....

This dissertation is copyright material protected under the Berne Convention, the Copyright Act of 1999 and other international and national enactments, in that behalf, on intellectual property. It may not be reproduced by any means, in full or in part, except for short extracts in fair dealing, for research or private study, critical scholarly review or discourse with an acknowledgment, without the written permission of the Directorate of Postgraduate Studies, on behalf of both the author and the Muhimbili University of Health and Allied Sciences.

ACKNOWLEDGEMENT

I would like to thank the Almighty for giving me the ability to develop and successfully complete this dissertation.

My gratitude and appreciation to my supervisor, Dr. Sabria Rashid who tirelessly gave her valuable time and advice throughout this work.

My heartfelt gratitude and appreciation to all members of academic staff in the Department of Obstetrics and Gynecology at MUHAS and MNH for their valuable inputs that greatly improved this work.

Lastly, my sincere appreciation to all women who participated in this study.

DEDICATION

I dedicate this work to my parents, husband and son who have been supportive throughout this period.

ABSTRACT

Background: Adequate knowledge on the discharge information is one of the key elements in improving the quality of care and health outcomes. Hypertensive disorders in pregnancy (HDP) are one of the leading causes of the persistently high maternal mortality ratio in Tanzania. Assessment of the knowledge on discharge information given to patients with hypertensive disorders in pregnancy will help analyze the practice, recognize gaps and pave areas for improvement which will subsequently improve the quality of maternal health.

Methodology: An analytical cross-sectional study was carried out at Muhimbili National Hospital from September to November 2020. Exit face-to-face interviews were conducted among 422 women with Hypertensive disorders in pregnancy who were conveniently recruited during discharge. We used a Swahili translated structured questionnaire adopted from World Health Organization (WHO), California Medical Quality Care Collaborative tool kit (CMQCC), and previous studies. The questionnaire consisted of 30 questions divided into 5 parts: Social demographic and obstetric characteristics, postpartum danger signs, diagnosis, medication, and follow-up plan. A composite score was used to group the knowledge level. One with at least a half or more of the maximum score in each domain were defined as adequate knowledge. Data collected was analyzed using Statistical Package for Social Sciences (SPSS) version 23.0. Descriptive statistics such as frequency and means were used to summarize and describe obtained data. A chi-square test was used to determine association between the social demographic and obstetric factors with knowledge on discharge information. Logistic regression was used to determine which factors strongly affect the knowledge on discharge information. The results were expressed as the Odds Ratio (OR), with statistically significant level at $p < 0.05$ and 95% Confidence Interval (CI).

Results: Seventy-three percent of women with HDP had adequate knowledge on the discharge information. In each domain, 79% of women had adequate knowledge on postpartum danger signs, 77% in diagnosis, 87% in prescribed medications and 92% in follow up plan. Women who were married, employed, with higher level of education, booked ANC at an early

gestational age of less than four months and had more than four ANC visits were more likely to have adequate knowledge on discharge information.

Conclusion: Most women with hypertensive disorders in pregnancy had an adequate knowledge on their discharge information. As observed from our study, most women were in the younger age group and primiparous, greater emphasis and a more tailored education must be given to these women due to high rate of recurrence of this condition in subsequent pregnancies.

TABLE OF CONTENTS

CERTIFICATION	i
DECLARATION AND COPYRIGHT	ii
ACKNOWLEDGEMENT	iii
DEDICATION	iv
ABSTRACT	v
TABLE OF CONTENTS	vii
LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF ABBREVIATIONS	xi
OPERATIONAL DEFINITIONS	xii
1.0 INTRODUCTION	1
1.1 Background	1
1.2 Literature Review	4
1.2.1 Knowledge on discharge information given to patients with HDP	4
1.2.2 Factors affecting knowledge of discharge information	6
1.3 Problem Statement	8
1.4 Conceptual Framework	9
1.5 Rationale of the study	10
1.6 Research Question	10
1.7 Research Objectives	10
1.7.1 Broad Objective	10
1.7.2 Specific Objectives	10
2.0 MATERIALS AND METHODS	11
2.1 Study design	11
2.2 Study Area	11
2.3 Study Population	12
2.3.1 Sample Population	12
2.4 Sample size	13

2.5 Inclusion and exclusion criteria	13
2.5.1 Inclusion criteria.....	13
2.5.2 Exclusion criteria.....	13
2.6 Sampling Procedure	14
2.7 Data Collection Tool.....	14
2.7.1 Pre-testing of the Questionnaire.....	14
2.7.2 Description of the Data Collection Tool	14
2.7.3 Description of Adequate level on knowledge of discharge information.....	16
2.8 Selection and training of research assistants.....	16
2.9 Variables and other information to be collected to address the objectives.....	17
2.9.1 Dependent variable.....	17
2.9.2 Independent variables.....	17
2.10 Data collection procedure	17
2.11 Data Management and Analysis	18
2.12 Ethical Considerations	18
2.13 Study Limitation and Mitigation.....	19
3.0 RESULTS.....	20
4.0 DISCUSSION.....	27
4.1 Strength.....	30
4.2 Limitations	30
5.0 CONCLUSION AND RECOMMENDATION	31
5.1 Conclusion	31
5.2 Recommendations.....	31
REFERENCES	32
APPENDICES	38
Appendix I: Consent Form English Version.....	38
Appendix II: Consent Form Swahili Version	41
Appendix III: Data Collection Tool (English Version)	44
Appendix IV: Data Collection Tool (Swahili Version)	49

LIST OF TABLES

Table 1: Social demographic and obstetric characteristics of participants.....	20
Table 2: Factors affecting knowledge on discharge information among patients with hypertensive disorders in pregnancy using Chi-Square test.	23
Table 3: Factors affecting knowledge on discharge information among patients with hypertensive disorders in pregnancy using logistic regression in bivariate and multivariate analysis.	25

LIST OF FIGURES

Figure 1: Conceptual framework of possible factors associated with the knowledge on discharge information.....9

Figure 2: The proportion of participants with hypertensive disorders in pregnancy having an adequate knowledge on the discharge information in each domain.....21

Figure 3:The proportion of participants with hypertensive disorders in pregnancy having an adequate knowledge on the discharge information22

LIST OF ABBREVIATIONS

ANC	Antenatal Clinic
EmONC	Emergency Obstetric and Newborn Care
LMIC	Low and Middle-Income Countries
MMR	Maternal Mortality Ratio
MoHCDGEC	Ministry of Health, Community Development, Gender, Elderly and Children
MUHAS	Muhimbili University of Health and Allied Sciences
WHO	World Health Organization

OPERATIONAL DEFINITIONS

Knowledge: Refers to facts, information and skills acquired through experience or education.

Adequate Knowledge: Defined as the proportion of patients with hypertensive disorders in pregnancy, delivered and discharged home, who knew $\geq 50\%$ of the vital information about the discharge.

Discharge Information: Refers to a set of instructions and information provided by a health care provider to a patient at the time of discharge which enables good home-based care. This information is given in two ways; verbally- where a patient is explained and counseled on a face-to-face basis and written- where an official document is given to a patient which allows continuity of care during follow-up visits by the primary care physician.

Hypertensive disorders in Pregnancy: Refers to elevated blood pressure readings during pregnancy, in which systolic blood pressure is greater than or equal to 140mmHg and/or diastolic blood pressure is greater than or equal to 90mmHg on two consecutive readings 6 hours apart. It encompasses a spectrum of disorders which include Gestational Hypertension, Preeclampsia (with or without severe features), Eclampsia, Chronic hypertension, and chronic hypertension superimposed with pre-eclampsia (with or without severe features).

1.0 INTRODUCTION

1.1 Background

Discharge information is a set of oral and written information given to patients at the time of discharge. It consists of the discharge diagnosis, early warning signs that should prompt the patient of an immediate return to the hospital, directions of usage of prescribed medications, an appointment for a follow-up visit, wound care, dietary counseling, family planning, return to work, resumption of sexual activity, education on self-care such as maintenance of personal hygiene and breastfeeding (1). It functions for an easy transition of care from in-patient health provider-based to home-based care. Appropriate information delivered to the patient and family members at the time of discharge will help reduce anxiety related to home care and lead to improved desired health outcomes. Hospitals have a responsibility to ensure that patients are discharged from hospital-based in-patient to out-patient care safely and efficiently (2).

Discharge information must be given in a way that the patient understands including avoiding the use of medical jargons (3). Adequate time must be attributed for communication of vital information pertaining to the patient's health in a language that they understand and allowing time for asking questions, clarification of concepts and ensure recall of information (4). Busy hospital environment and increased patient to doctor ratio are one of the factors leading in inadequacies in the knowledge of discharge information (5). Inefficiencies in discharge information leads to unnecessary readmission and consequently a financial burden to the patient and family (6). Low level of education and low income corresponds to lower health literacy levels and has been attributed to inadequacies in knowledge of discharge information as observed in a study done in the emergency department in Ottawa, Canada where the knowledge of discharge information was significantly low in all domains of discharge medications, diagnosis, follow up plan and return to ED instructions (7).

A pregnant woman is considered hypertensive if her blood pressure is greater than or equal to 140/90 mmHg on two consecutive measurements 6 hours apart (8). HDP include gestational hypertension, pre-eclampsia, chronic hypertension, and chronic hypertension superimposed with pre-eclampsia. Preeclampsia complicates about 3% of pregnancies and all HDP affect about 5-10% of pregnancies worldwide(9).

The current global maternal mortality ratio is unacceptably high. Estimates from 2017 show 295,000 maternal deaths occurred globally of which 196,000 (66%) occurred in Sub-Saharan Africa. Tanzania is among the African countries with the highest maternal mortality ratio of 556 per 100,000 live births with most deaths occurring during the intrapartum and immediate postpartum period (10). A 10-year retrospective study done in Tanzania between 2006 to 2015 showed a 40% increase in hospital-based maternal mortality ratio of which 34% of the total deaths occurred due to eclampsia (11). A meta-analysis done in 1996 to review postpartum maternal deaths found that more than 60% of maternal deaths occurred during the postpartum period; 45% of postpartum deaths occurred within 1 day of delivery, more than 65% within one week and more than 80% within 2 weeks due to direct obstetric causes and HDP being one of them (12). Around 40,000 women, mostly from developing countries, die each year due to preeclampsia or eclampsia. Preeclampsia alone is estimated to account for about 40% to 60% of maternal deaths in developing countries(13). In Nigeria, which ranks second globally in the number of maternal deaths, it is estimated that pre-eclampsia and eclampsia contributed to 36% of the total deaths and was the second direct obstetric cause of maternal mortality after postpartum hemorrhage (14). In a recent report by the CDC, it was found that about 36% of maternal deaths happened at delivery or in the week after and about 33% happened one week to one year postpartum and hypertension was one of the leading cause (15).

Hypertensive disorders in pregnancy (HDP) are a major threat to pregnant women complicating 5.2%-8.2% of pregnancies globally (16). They are associated with an increased risk of adverse fetal, neonatal, and maternal outcomes including premature delivery, fetal growth restriction, intrauterine death, renal or hepatic failure, hemorrhage, and stroke(17).

Women who experience preeclampsia are at an increased risk of the condition recurring in a future pregnancy (18). In Tanzania, it was found that the recurrence rate of pre-eclampsia was 25% in subsequent pregnancies (19). In the USA, the recurrence of HDP was 58%-94% in subsequent pregnancies (20).

Women with HDP also have approximately double the risk of cardiovascular disease including hypertension, ischemic heart disease, and stroke in later life (21). Cardiovascular disease remains the leading cause of death in females (22). Women with HDP had twice the risk of cardiovascular readmission within 3 years of delivery (23).

This study aimed to assess the knowledge on discharge information and its associated factors given to patients with hypertensive disorders in pregnancy at Muhimbili National Hospital in Dar es Salaam, Tanzania. This will contribute to body of knowledge on remedial factors to reduce high maternal mortality from HDP.

1.2 Literature Review

1.2.1 Knowledge on discharge information given to patients with HDP

The high maternal mortality ratio in LMIC has been attributed to three delays namely; delay in deciding to seek health care, delay in reaching to seek health care on time, and lastly delay in receiving appropriate health care (24). Delay in deciding to seek health care is largely attributed to a lack of awareness of the obstetric danger signs. In Northern Ethiopia, it was found that the knowledge of at least one obstetric danger sign was found to be 55.1% (25). Another study done in Palestine showed that only 17-19% of women received discharge information on the danger signs (26).

Readmissions, adverse events, and unscheduled visits following discharge from a hospital are costly, life-threatening, and importantly avoidable if communication and comprehension of discharge information given to patients at the time of discharge are improved (27). A study done in the USA found that nearly one-fifth of the readmissions could have been prevented if the process of discharge which involves good communication of discharge information and patient comprehension of the information provided was improved (27). Higher number of readmissions have been attributed owing to HDP in Illinois, USA where 27% of obstetric readmissions were attributed to HDP representing 57% of all obstetric readmissions which were preventable (28).

A study done in Chicago to evaluate the areas of knowledge deficits in the discharge information given to a patient in the Emergency Department using four domains namely, diagnoses, follow-up, medication use, home-care instructions, and follow up instructions found that deficits were demonstrated by the majority of patients in the domain of home care instructions (80%) and return instructions (79%) which is alarming in terms of patient adherence and outcomes while less frequent deficits were found for the domains of follow-up (39%), medications (22%), and diagnosis (14%) (29).

Knowledge on post-natal follow-up care is an important component of discharge information as it increases adherence, early recognition of symptoms helps prevent complications following childbirth. In Tanzania, it has been observed that only one-third (34%) of women receive postnatal checkups within 2 days while 63% did not receive any post-natal checkups within 41 days of delivery (30). Lack of proper counseling on the importance of postnatal care was found to be one of the factors associated with decreased adherence to postnatal care (26).

Knowledge of the use of prescribed medications following discharge is an important component of effective continuity of care. Patients' lack of knowledge regarding their discharge medications can adversely affect their compliance, negatively impact their health and worsen the prognosis (31). In Turkey, it was found that 37% of patients had no knowledge about their prescribed medications at the time of discharge (32). In California, only 48% of discharged patients knew the name of their medications, 39% knew the frequency and only 24% knew the dosages (33).

At the time of discharge, patients become very excited and therefore they think much about home hence, comprehensive discharge instructions in a way patients understand are necessary to ensure a smooth transition of care from hospital to home, as the responsibility of care shifts from healthcare providers to patients and caregivers. A systematic review published in 2005 revealed that a combination of verbal and written discharge information made patients more knowledgeable and satisfied (34). Unfortunately, patients' go home without having adequate knowledge of the critical information regarding their hospital stay, therefore, leaving them dissatisfied with the information provided during discharge and increasing risks of adverse health outcomes and hospital readmissions (35). Busy working environment of the hospital, increased patient to doctor ratio and increased work load of the medical personnel leads to decreased amount of time dedicated for effective communication of discharge instructions where most of the vital information is not communicated hence leaving the patient with poor knowledge of the vital information pertaining to their health (5).

Improving maternal health is one of the thirteen targets for Sustainable Development Goal 3 (SDG-3) which can be achieved by improving the quality of care provided by health facilities which would reduce the short-term and long-term complications, readmission rates, and mortality rates among women. One key point would be to improve the transition from hospital-based to home-based care which would benefit greatly by improving the knowledge on discharge information. From previous studies, gaps in the knowledge on danger signs, medication use, diagnosis and follow up visit have been seen however, there is a scarcity of studies on the knowledge of discharge information given to patients with HDP in Tanzania. Therefore, need for such a study was paramount in a tertiary and teaching hospital offering the highest level of care in the country.

1.2.2 Factors affecting knowledge of discharge information

Socio-demographic factors may influence the knowledge of discharge information and may adversely affect the quality of obstetric care. Among the socio-demographic characteristics, older women aged 25 to 44 years who were married and multiparous had a better knowledge of discharge information in view of better understanding and maturity that comes with age, emotional stability and being experienced with child birth (36). Women who have at least a primary level of education and were employed were found to have a good knowledge on discharge information which could be attributed to financial stability, independent thinking, greater ability to seek knowledge, better recall, clarification of concepts and good understanding (4,36). A study done in the Emergency Department in Ottawa, Canada showed inadequacies in the knowledge on discharge information among patients with low income and low level of education (7). Early gestational age at booking antenatal clinic and more than four antenatal visits has been found to be associated with a better knowledge on discharge information which can be justified by the fact that it leads to increased number of clinician to patient encounters, early identification of high risk pregnancies, early initiation of care and counseling on vital information pertaining their condition (37,38).

History of hypertension in previous pregnancies has been associated with a better knowledge on the discharge information since these women are exposed to this condition and hence have a better understanding of it (36).

1.3 Problem Statement

With the increasing burden of maternal morbidity and mortality in Tanzania (39), the provision of enhanced quality of care to women with HDP is paramount to reduce adverse health outcomes. Ensuring patients have an adequate knowledge on discharge information is one of the key elements in providing quality obstetric care and the improvement of health outcomes.

Previous studies have shown inadequacies in the knowledge of discharge information leading to adverse health outcomes (29). Important information such as knowledge of danger signs (25)(26), discharge medications (32) and follow up plan (26) has been inadequate leading to high rate of postpartum readmission (28), complications (23) and recurrence of the condition in subsequent pregnancies (19).

However, despite the persistently high maternal morbidity and mortality attributed to HDP in Tanzania (39), there is a scarcity of data on the knowledge on discharge information given to patients with these complications. One key point to improve the transition from hospital-based in-patient care to out-patient care would be by improving the knowledge on discharge information. Therefore, this study provided a platform to assess knowledge of discharge information among patients with HDP.

1.4 Conceptual Framework

Figure 1 below shows the conceptualization of knowledge on discharge information given to women with hypertensive disorders and their associated factors. Knowledge on discharge information may be affected by various factors that may be demographic factors such as the age, social-economic status, and education level may also affect knowledge of discharge information by an individual or obstetric/gynecological factors such as mode of delivery of a mother, parity, gravidity, multiple births, number of ANC visits, and survival of the child.

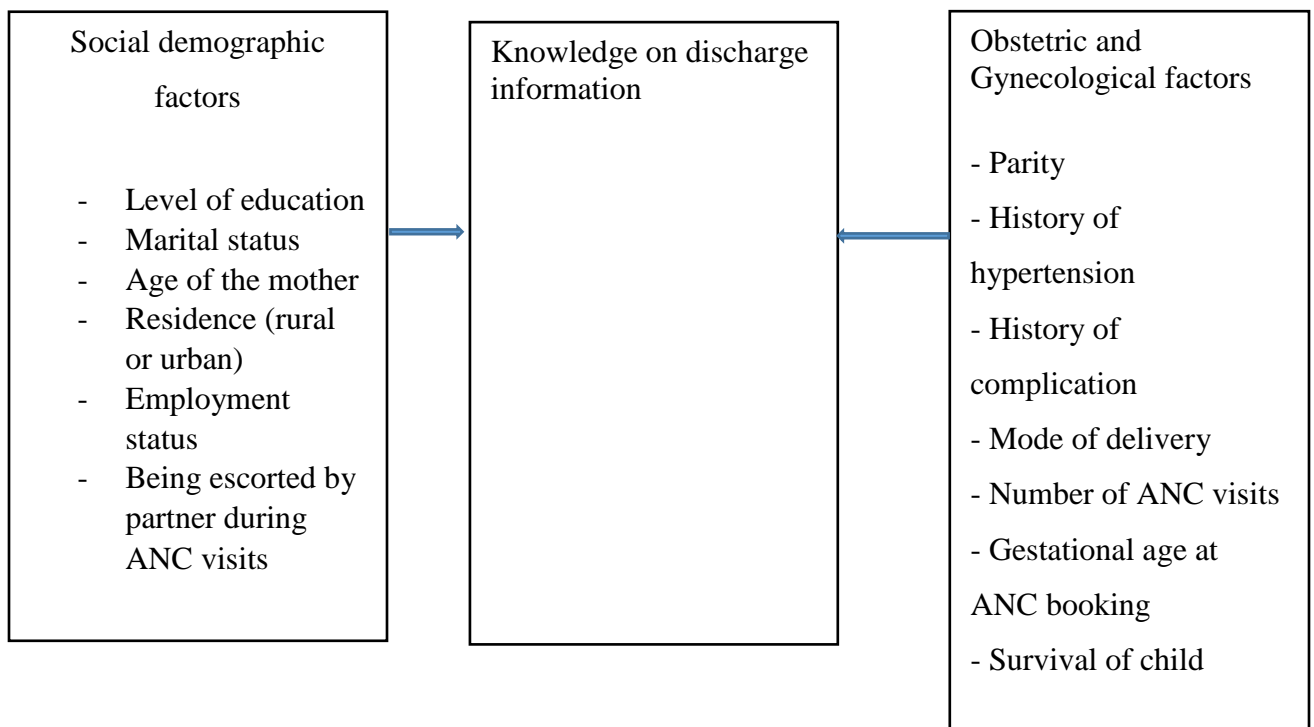


Figure 1: Conceptual framework of possible factors associated with the knowledge on discharge information

1.5 Rationale of the study

As HDP is at an increasing trend with an increased rate of complications, readmissions, and recurrence rates, assessment of knowledge on discharge information in such patients is imperative. Findings from this study shall provide an ideal framework to recognize areas of weakness to be addressed to improve the quality of care. Proposed findings will provide solutions that will lay a platform for the development of institutional guidelines and help policymakers formulate standard guidelines to improve the quality of care.

1.6 Research Question

What is the knowledge on discharge information and its associated factors among patients with hypertensive disorders in pregnancy at MNH in Dar es Salaam, Tanzania?

1.7 Research Objectives

1.7.1 Broad Objective

To assess the knowledge on discharge information and its associated factors among patients with hypertensive disorders in pregnancy at MNH in Dar es Salaam, Tanzania.

1.7.2 Specific Objectives

1. To determine the knowledge on discharge information among patients with hypertensive disorders in pregnancy.
2. To analyze factors affecting knowledge on discharge information among patients with hypertensive disorders in pregnancy.

2.0 MATERIALS AND METHODS

2.1 Study design

This was a hospital-based analytical cross-sectional study which was done at the Department of Obstetrics and Gynecology, MNH for a period of three months from September 1st to November 30th, 2020.

2.2 Study Area

This study was conducted at MNH, department of Obstetrics and Gynecology. MNH is the largest referral and teaching hospital in the United Republic of Tanzania, an affiliate of Muhimbili University of Health and Allied Sciences (MUHAS). It is in the city of Dar-es-Salaam, which is the largest commercial city in Tanzania with a population of 4,364,541 and an annual growth rate of 5.6% (National Census 2012). The city has five municipalities (Kinondoni, Temeke, Kigamboni, Ubongo and Ilala). The hospital has a bed capacity of 1500, 25 departments, and 10 specialized units. The Muhimbili National hospital is the largest government-owned and run tertiary care hospital, serving as a national referral hospital and a teaching hospital for MUHAS. The department has 7 wards, divided into 4 units/firms (I, II, III, IV) for inpatient obstetric cases, one labor ward, an obstetric intensive care unit, and a high-dependency unit. It has an operating theatre for obstetric and gynecological cases with 4 operating rooms running 24 hours a day. The average number of admissions per month is 1000-1500 cases with an average delivery of 800 cases.

All pregnant women received at the main reception and allocated to the respective ward depending on the patient's condition and unit on call. These include patients referred from other health facilities, from the antenatal clinic and those coming directly from home. There are 4 units/firms allocated at the maternity block. The distribution of obstetric wards is according to the unit/firm. Patient allocation to the respective obstetric ward depends on the firm/unit on call. The average bed capacity in each ward is 32 to 38 beds. Those patients who are clinically or hemodynamically unstable are admitted directly to the maternity ICU. Patients with HDP (severe pre-eclampsia and eclampsia) are admitted to the intensive care

unit or high dependency unit where they are stabilized and delivered after which they are transferred to the respective postnatal ward. Women who are in labor are admitted directly to the labor ward and those requiring an emergency cesarean section are reviewed and prepared for surgery after which they are transferred to the respective obstetric ward. There is always an available medical team on call for a 24-hour shift composed of an intern doctor, two residents, and one specialist to review the admitted patients.

Discharge planning for a patient is done during the morning ward round where a group of consultants, specialists, intern doctors, residents, registrars and nurses review every patient in the ward. The patient is assessed thoroughly before discharge planning. Those fit for discharge that is, those patients whose blood pressures have been stabilized and are clinically stable are counseled on the important information about their health during the rounds after which a discharge summary is written by the doctor and the discharge process initiated after the rounds. The discharge information- both verbal and written at the time of discharge is normally given by specialists, residents, interns and nurses at the time of planning discharge and during the hand-over of discharge summaries.

2.3 Study Population

This study comprised all women with hypertensive disorders in pregnancy discharged home from the postnatal wards in the Department of Obstetrics and Gynecology at MNH during the study period.

2.3.1 Sample Population

All discharges among women with HDP from the postnatal wards in the Department of Obstetrics and Gynecology at MNH during the study period.

2.4 Sample size

The sample size was derived from the following formula:

$$n = \frac{z^2 p (1-p)}{\epsilon^2}$$

Where:

Z: Standard normal deviate = 1.96 for 95% confidence level

P: The expected proportion of women with an adequate knowledge of discharge information is determined from previous studies. As there was no prior cross-sectional study done in this area, a proportion of 50% was taken.

ϵ : Margin of error = 5%

The calculated sample size was 384 women.

The non-response rate of 10% was added to the calculated sample size

The calculated sample size was $\{(10\% \times n) + n\}$ which is $38.4 + 384 = 422$

Therefore, the sample size was 422 women with HDP, have delivered and discharged home from the postnatal wards in the Department of Obstetrics and Gynaecology at MNH, Dar es Salaam, Tanzania.

2.5 Inclusion and exclusion criteria

2.5.1 Inclusion criteria

All women diagnosed with HDP (Gestational Hypertension, Preeclampsia with or without severe features, Eclampsia, chronic hypertension and chronic hypertension superimposed with pre-eclampsia) delivered (since majority of these patients are delivered prior to discharge), had consented to participate in the study and were being discharged home during the study period.

2.5.2 Exclusion criteria

Women with mental illness that caused communication difficulties.

2.6 Sampling Procedure

A consecutive convenience sampling method was done in each of the postnatal wards by the trained research assistants whereby all those women diagnosed with HDP, had delivered, were being discharged home at the time of the study, met the eligibility criteria and signed an informed voluntary consent were included until the desired sample size was reached as identified from the nurses' ward round register book at the nursing station. The sample population was recruited and exit face-to-face interviews were conducted by 7 research assistants who were trained on data collection procedures in each postnatal ward under the supervision of the Principal Investigator. The role of the principal investigator was to supervise the collection of data, check for correctness and consistency and answer questions or clarify doubts during the data collection process.

2.7 Data Collection Tool

Data was collected through face-to-face exit interviews using a Swahili translated structured questionnaire that was adopted from a previous study, California Maternal Quality Care Collaborative tool kit (CMQCC) and WHO guideline for postnatal care (Appendix 1).

2.7.1 Pre-testing of the Questionnaire

A pilot survey and pre-testing of the questionnaire were done in the postnatal wards before the collection of data. A Swahili version of the questionnaire as translated by a professional translator was used to collect data. Data collected from the piloted survey were not included in the analysis. The questionnaire was well understood by the participants and hence changes were not made after the pilot survey.

2.7.2 Description of the Data Collection Tool

The questionnaire consisted of five parts and a total of 30 questions using a combination of open and more focused questions.

Part 1: Consisted of 16 questions on social demographic and obstetric characteristics including age, marital status, level of education of self and spouse/partner, employment status of self and spouse/partner, area of residence, parity, gestational age at booking of the antenatal clinic, the total number of times of antenatal visits in index pregnancy, if escorted by a partner during antenatal visits, history of hypertension in the index or previous pregnancies, history of use of antihypertensive, history of complication(s) in a previous pregnancy, mode of delivery and condition of the neonate at birth.

Part 2: Consisted of 2 questions on knowledge of postpartum danger signs. The first question being if she was aware of the danger signs associated with hypertension in pregnancy and if answered 'yes', then to mention the danger signs. The list included 7 danger signs which were severe headache, fits/convulsions, blurry vision, pain in the belly on the right upper area below the right ribs, worsening of swelling of the legs, arms, or whole-body, difficulty in breathing and loss of consciousness.

Part 3: Consisted of 2 questions on the knowledge on diagnosis. The first question was if she knew her diagnosis and the second question is stating her diagnosis. Due to challenges in finding an exact Swahili term for the spectrum of HDP, a pragmatic approach was used.

Part 4: Consisted of 6 questions on knowledge of treatment plan (medications). The first question is if she was prescribed any discharge medications during discharge and the second being details of the medications which entailed 5 questions such as name, dosage, frequency, purpose, and duration of the medication(s).

Part 5: Consisted of 4 questions on the follow-up plan. The first question if she was told to return for follow up and the second question being the details of the follow-up visit which entailed three questions on a date, place, and purpose of the follow-up visit.

2.7.3 Description of Adequate level on knowledge of discharge information

A composite scoring system was used to assess the knowledge on discharge information among women with HDP. For the domain of knowledge on postpartum danger signs, a score of 2 was given for each danger sign mentioned by the patient and 0 for those not mentioned. The minimum score was 0 and maximum score was 14. For the domain of diagnosis, a score of 1 was given if the patient answer 'yes' to knowing her diagnosis and stated it correctly, and 0 if she did not know her diagnosis or stated it incorrectly. The minimum score was 0 and maximum score was 1. For the domain of knowledge on medications, a score of 2 was given if she was able to correctly mention each the dose and the frequency of medication(s), a score of 1 if she was able to mention the name, purpose and duration of the medication and 0 if she was not able to correctly mention any variable. The minimum score was 0 and maximum score was 7. For the domain of follow-up visit, a score of 2 was given if she could correctly state each the date and place of follow-up visit, 1 score if she correctly stated the purpose of follow up visit and 0 if she was not able to answer any variable. The minimum score was 0 and a maximum score of 5. Those able to score a half or more questions correctly in each domain were categorized as having adequate knowledge. The general mean score was generated for our study using the sum of the mean scores in each domain divided by the total score of that domain and converted into percentage. The general mean score for our study was 58.99% (SD=21.98). The cut-off scoring system for our study was 50% whereby those score less than 50% were categorized at having an inadequate knowledge of discharge information and those scoring more than or equal to 50% were categorized as having adequate knowledge of discharge information as seen in other similar studies.

2.8 Selection and training of research assistants

Seven research assistants were selected who were medical students. Since there were a total of 7 postnatal wards (ward 32, 33, 38, 39, 40, 41 and 42), one assistant was placed in each of the wards. They were trained and familiarized with the study objectives and how to collect data using the questionnaire provided. Their role was to recruit the study subjects, obtain written

informed voluntary consent, and conduct face-to-face interviews with the subjects using a Swahili translated questionnaire.

2.9 Variables and other information to be collected to address the objectives

2.9.1 Dependent variable

Patient score on the level of knowledge of discharge information

2.9.2 Independent variables

- Socio-demographic factors (Age, marital status, socio-economic status, residence, education level and occupation).
- Obstetric factors such as parity, number of ANC visits, mode of delivery, and survival of the child.

2.10 Data collection procedure

Data were collected by the principal investigator and seven research assistants who were trained on the data collection tool by the principal investigator from 1st September to 30th November 2020. This period of data collection was chosen since it is a vacation period and hence sufficient time for efficient data collection. Data were collected daily (Monday to Sunday) from 1400hrs as this is the time the morning rounds were completed, and the decision of discharge planning has been made. The entry point for data collection was the ward round register at the nursing station in each ward which notes down the list of all patients in the ward, their diagnosis along those planned for discharge that day. The sample population was recruited in the manner as explained above.

It normally takes three to four hours for the patient to leave the hospital from the time of completion of ward rounds during which the sample population was captured. Since the time of provision of discharge information and time of exit interview was not lengthy, recall biases were minimized significantly. Exit interviews using a structured Swahili translated questionnaire were used to collect data on the level of knowledge of discharge information among women with HDP at the time of discharge.

2.11 Data Management and Analysis

Data collected were sorted and checked manually daily soon after the interview for their completeness and consistency. The data was coded manually then entered and cleaned using Statistical Package for Social Sciences (SPSS) version 23.0 for analysis. Descriptive statistics were used to summarize and describe obtained data.

Objective number one was analyzed using composite scoring system in each domain. Scores above the mean for each domain were used to generate an overall score. Those scores that were $<50\%$ were categorized as inadequate knowledge and those scores that were $\geq 50\%$ were categorized as adequate knowledge. Pie chart was used to express the data.

For objective number two, the chi-square test was used to determine the social demographic and obstetric factors affecting knowledge of discharge information that were statistically significant. Those factors that were found to be statistically significant in chi-square test ($p < 0.05$), were entered into logistic regression model. Also, bivariate and multivariate logistic regression was used to determine which factors among these strongly affect the knowledge of discharge information. The results were expressed as the Odds Ratio (OR) with statistically significant level at $p < 0.05$ and 95% Confidence Interval (CI).

2.12 Ethical Considerations

Approval to conduct the study was sought from Muhimbili University of Health and Allied Sciences (MUHAS) Senate Research and Publication Committee (Ref. No.: MNH/TRCU/Permission/2020/066). Permission to conduct the study was sought from the Executive Director and Head of Department of Obstetrics and Gynecology at MNH. A Swahili translated informed consent form was signed by the potential study participants before obtaining data from them. Confidentiality and anonymity were maintained by taking the participants to a side room for obtaining data, no names of the participant or discharging doctor were mentioned. Patients were reassured to be given medical services equally regardless of their readiness to participate in the study and the missing relevant important information was provided to them.

2.13 Study Limitation and Mitigation

Biases resulted from recall bias. The tendency of respondents to forget or wrongly comprehend the information given at discharge was encountered. Exit interviews were done within 2-3 hours of discharge to reduce recall bias.

3.0 RESULTS

During the study period from 1st September to 30th November 2020, there were a total of 1377 discharges of which 422 women met the inclusion criteria were recruited. The rest had other diagnosis. Table 1 shows their social demographic characteristics.

Table 1: Social demographic and obstetric characteristics of participants (N=422)

Variable	Frequency (%) (N=422)
Marital status	
Single	60 (14.2)
Married	308 (73)
Divorced	8 (1.9)
Cohabiting	42 (10)
Widowed	4 (1)
Level of education	
No formal education	58 (13.7)
Primary Education	320 (75.8)
Secondary and higher	44 (10.4)
Occupation status	
Employed	79 (18.7)
Unemployed	240 (56.9)
Pretty trader	103 (24.4)
Mode Of Delivery	
SVD	284 (67.3)
CS	138 (32.7)
Age group	
Less than 20	61 (14.5)
20 to 34	308 (73)
35 and above	53 (12.6)
Parity group	
Prim parous	203 (48.1)
2 and 3	153 (36.3)
4 and above	66 (15.6)

Most of the women were between the age range of 20 to 34 years (73%) with a mean age of 26.76 (SD = 6.25). The majority were married (73%) with a primary level of education (75.8%) and were unemployed (56.9%).

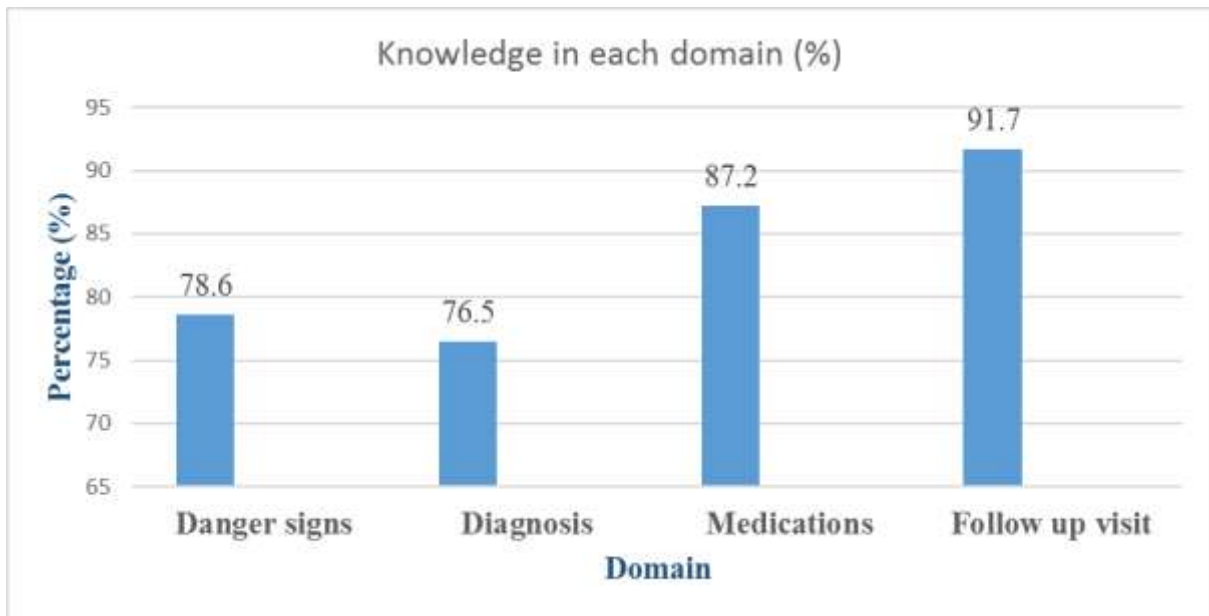


Figure 2: The proportion of participants with HDP having an adequate knowledge on the discharge information in each domain (N=422)

The proportion of women with HDP having an adequate knowledge in each domain- Postpartum danger signs (78.6%), Diagnosis (76.55%), Medications (87.2%) and follow up visit (91.7%).

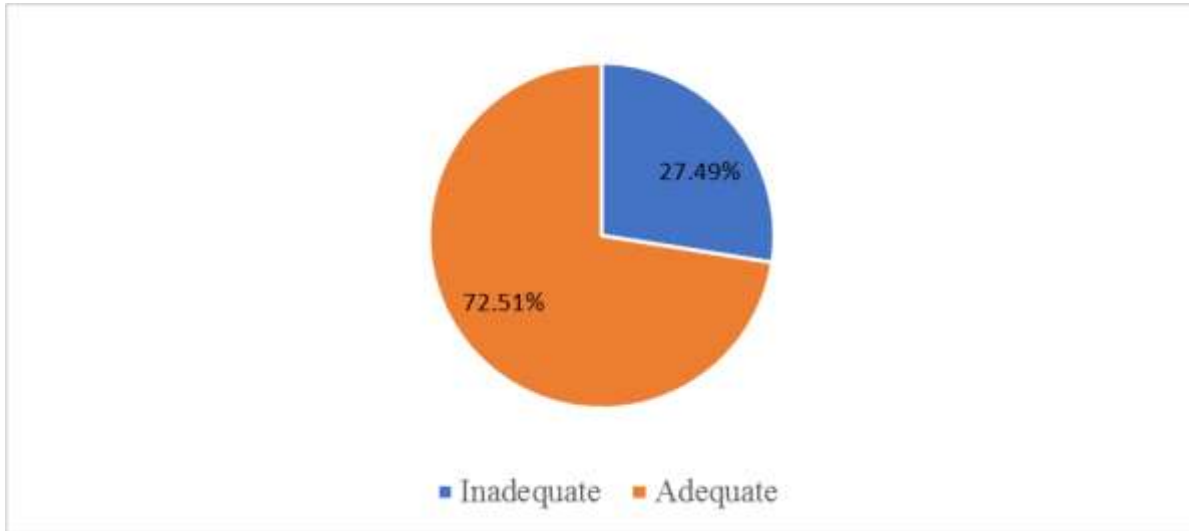


Figure 3: The proportion of participants with HDP having an adequate knowledge on the discharge information (N=422)

Most of the patients (72.5%) had an adequate knowledge on their overall discharge information.

Table 2: Factors affecting knowledge on discharge information among patients with HDP using Chi-Square test (N=422).

Variable	Knowledge status		p-value
	Inadequate (N=116) Frequency (%)	Adequate (N=306) Frequency (%)	
Marital status			
Single	35(30.2)	25(8.2)	<0.001
Married	58(50.0)	250(81.7)	
Divorced	3(2.6)	5(1.6)	
Cohabiting	19(16.4)	23(7.5)	
Widowed	1(0.9)	3(1.0)	
Education level of mother			
No formal education	36(31.0)	22(7.2)	<0.001
Primary education	67(57.8)	253(82.7)	
Secondary education	13(11.2)	31(10.1)	
Employment status of mother			
Employed	5(4.3)	74(24.2)	<0.001
Unemployed	74(63.8)	166(54.2)	
Pretty trader	37(31.9)	66(21.6)	
Age group			
Less than 20	40(34.5)	21(6.9)	<0.001
20 to 34	69(59.5)	239(78.1)	
35 and above	7(6.0)	46(15.0)	
Parity			
Once	70(60.3)	121(39.5)	<0.001
2 to 3	36(31.0)	117(38.2)	
4 and above	10(8.6)	68(22.2)	
Number of ANC visits			
Less than four	62(53.4)	47(15.4)	<0.001
Four or more	54(46.6)	259(84.6)	
Gestation age at first antenatal booking			
< 4 months	36(31.0)	218(71.2)	<0.001
≥ 4 months	80(69.0)	88(28.8)	
History of hypertension in previous pregnancy			
No	105(90.5)	227(74.2)	<0.001
Yes	11(9.5)	79(25.8)	
Condition of neonate at discharge			
Alive	95(81.9)	284(92.8)	<0.001
Dead	21(18.1)	22(7.2)	
Mode of delivery			
SVD	78(67.2)	206(67.3)	0.988
Cesarean section	38(32.8)	100(32.7)	

Knowledge on discharge information was associated with marital status, level of education, employment status, age of the mother, parity, gestational age at antenatal booking, number of antenatal visits, history of hypertension in previous pregnancy and condition of neonate at discharge.

Table 3: Factors affecting knowledge on discharge information among patients with HDP using logistic regression in bivariate and multivariate analysis (N=422).

Variable	Total	Bivariate analysis		Multivariate analysis	
		COR (95%CI)	P Value	AOR (95%CI)	P Value
Marital status					
Single	60	1	1	1	1
Married	308	6.03(3.35-10.86)	0.001	2.39(1.09-5.23)	0.029
Divorced	8	2.33(0.51-10.67)	0.275	1.77(0.28-10.93)	0.537
Cohabiting	42	1.69(0.77-3.75)	0.194	0.91(0.34-2.46)	0.857
Widowed	4	4.2(0.41-42.77)	0.225	2.60(0.20-34.62)	0.469
Level of education					
No formal education	58	1	1	1	1
Primary education	320	6.18(3.41-11.20)	<0.001	3.93(1.84-8.39)	<0.001
Secondary education	44	3.90(1.69-9.01)	0.001	1.72(0.56-5.31)	0.346
Employment status					
Employed	79	1	1	1	1
Unemployed	240	1.15(0.05-0.39)	<0.001	0.18(0.64-0.52)	0.002
Pretty trader	103	0.12(0.44-0.32)	<0.001	0.20(0.67-0.63)	0.005
Age group					
Less than 20	61	1	1	1	1
20 to 34	308	6.59(3.65-11.93)	<0.001	2.33(1.01-5.41)	0.048
35 and above	53	12.51(4.82-32.51)	<0.001	3.46(0.98-12.16)	0.053
Parity					
Once	191	1	1	1	1
2 to 3	153	1.88(1.16-3.02)	0.009	0.72(0.38-1.39)	0.34
4 and above	78	3.93(1.90-8.13)	<0.001	1.19(0.45-3.13)	0.728
Number of ANC visits					
Less than four	109	1	1	1	1
Four or more	313	6.32(3.91-10.21)	<0.001	1.88(0.92-3.84)	0.03
Gestation age at first antenatal booking					
< 4 months	254	1	1	1	1
≥ 4 months	168	0.18(0.11-0.28)	<0.001	0.51(0.26-0.97)	0.041
History of hypertension in previous pregnancy					
No	332	1	1	1	1
Yes	90	3.32(1.69-6.50)	<0.001	1.19(0.51-2.80)	0.686
Condition neonatal at discharge					
Alive	379	1	1	1	1
Died	43	0.35(0.18-0.67)	0.001	0.622(0.27-1.46)	0.274

COR- Crude Odds Ratio. **AOR-** Adjusted Odds Ratio

There is a statistically significant association between marital status, level of education, employment status of the woman, gestational age at antenatal booking and number of times of antenatal visits.

4.0 DISCUSSION

Our study found that more than three quarters of the patients had an adequate knowledge on their discharge information which included knowledge on postpartum danger signs, use of medications, their diagnosis and follow up visit. This could be attributed to the fact that this study was conducted at a tertiary hospital which mostly accommodates high-risk patients hence greater experience in dealing with such patients, having well-trained and adequate number of health care professionals and well-equipped facilities. Our study also showed that adequate knowledge of discharge information was independently associated with the woman being educated, married, employed, having started antenatal clinic at an early gestational age and having more than four antenatal visits during index pregnancy. These findings could be explained by the fact that being married, educated and employed makes a woman emotionally and financially stable. Earlier gestational age at booking and more than four antenatal visits during index pregnancy ensures more frequent encounters between the patient and the care provider hence early identification of high-risk pregnancy and initiation of appropriate care including counseling. Our findings were similar to studies done in the emergency departments in Israel and Philadelphia where the knowledge on discharge information was reported to be 80% and 77% respectively (3,40). This could be explained by the similarity of the environment since these studies were also done at a tertiary hospital. However, in other places the findings were lower than what we observed such as studies done in an emergency department in Chicago and Ottawa, internal medicine department in New York and surgical department in San Francisco where the knowledge on discharge information was found to be low; 67%, 33%, 10% and 56% respectively (4,7,41,42). These findings could be attributed to the use of medical jargons during communication of discharge information, busy environment, increased patient to doctor ratio causing reduced amount of time spent for communication of discharge instructions to the patients and often, no time being given for clarification of vital concepts (3,5).

As observed from this study, most of the patients who had adequate knowledge on the postpartum danger signs, that means they could state at least three or more (more than half) of the postpartum danger signs. This could be explained by the fact that most of the women started antenatal clinic at an early gestational age and attended more than four visits during index pregnancy. These findings are consistent with those observed in Uganda (72%) and Ethiopia (76.5%) which was found to be associated with attending antenatal clinic at an early gestational age and had four or more visits hence more time for face-to-face encounters with the clinician and therefore, good education from the beginning (25,38).

Adequate knowledge of the details of follow-up visits is a vital component of quality obstetric care. Our study showed that a high percentage of patients were able to state the details of their follow-up visit. These findings could be justified by the fact that these women were categorized as high-risk hence emphasis was put on follow up care. Post-natal follow-up visit aims at thorough assessment of the patient including control of blood pressure and identifying risks that may bring long-term health morbidities. Adverse outcomes are not only restricted to index pregnancies but also subsequent pregnancies. Large observational studies have reported an increased risk of cardiovascular disease in women with HDP and a recurrence rate of 20.7% in subsequent pregnancies (43). Despite the adequate knowledge on follow-up visit, it was observed that only 34% of women receive postnatal checkups within 2 days while 63% did not receive any post-natal checkups within 41 days of delivery in Tanzania (30). This could be because the patient did not feel sick or was not told about the importance of the visit by the clinician. Also, low level of income could be another factor to lack of adherence to postnatal care in terms of transport fee to come for follow up visit.

Adequate knowledge of the discharge medications is vital to prevent adverse events related to non-adherence which can impact their health and worsen the prognosis. Our study showed adequate overall knowledge on medication which was higher than observed in other studies done in Turkey and North Carolina where 37% and 89.3% of patients had an inadequate knowledge of their medications at discharge medications respectively (32,44). The observed

difference in these findings could be explained by the fact that these patients were of older age, had multiple comorbidities and used multiple medications hence understanding and recall was inadequate whereas in our study, these women were of younger age and had a single diagnosis and few medications hence understanding and recall was easier.

Our study also showed that early gestational age at booking antenatal clinic and more than four antenatal visits and were associated with an adequate knowledge of discharge instructions which was consistent with other studies done in Tanzania and Uganda whereby early and frequent antenatal attendance were associated with an adequate knowledge (37,38). This is explained by the fact that early gestational age at booking antenatal clinic and frequent antenatal clinic visits results into more time for face-to-face encounters with the clinician and hence, early identification of high-risk pregnancies and initiation of appropriate care and treatment, good education from the beginning and as observed from our study, most women had attended four or more visits and booked antenatal clinic at an early gestational age as per the WHO recommendations. Good level of education was found to be associated with a good knowledge on discharge information as observed from our study. This is because that good level of education is directly proportional to good understanding, clarification of concepts and less confusion. These findings were consistent with a study done in 2014 in the Internal Medicine Department where higher education level was associated with adequate knowledge (4,36). Also, although no statistically significant relationship was found between multiparity and a history of hypertension in previous pregnancies, it was observed to be a strong factor in adequate knowledge of discharge information since these women are exposed and experienced to this condition and was also observed in a study done in a University Hospital in Illinois, USA where multiparous women and those with a history of hypertension in previous pregnancies demonstrated an adequate knowledge (36).

Adequate understanding of the discharge information empowers women and their families to be more confident and allows a smooth transition from in-patient hospital-based care to out-patient home-based care. Hence, at the time of discharge, the clinician must ensure completion

of three tasks: communication of crucial information, verify comprehension, and tailor teachings in areas of patient confusion or inadequate knowledge to ensure enhanced patient-center care. Although the knowledge on discharge information was adequate, the maternal mortality ratio in Tanzania remains to be elevated with HDP being one of the major direct obstetric cause, other studies should be conducted to focus on the areas of gaps to identify the causes of these mortalities.

4.1 Strength

1. This is the first obstetric focused study in our set-up that has looked at the knowledge on discharge information among patients with hypertensive disorders in pregnancy through each domain of understanding of postpartum danger signs, diagnosis, medications and follow-up visit plan.
2. This study looked at a single health condition which is one of the highest contributors of maternal mortality and assessed the areas of shortcoming of patients' knowledge hence excluded the confounding effect of other health conditions.
3. Face to face exit interviews were conducted to reduce recall bias.

4.2 Limitations

This study was conducted at a tertiary care setting (MNH) that treats various obstetric conditions and has the advantage of more resources (infrastructure and human resources), as a result, findings and recommendations might not be generalized to all health facilities in the country.

5.0 CONCLUSION AND RECOMMENDATION

5.1 Conclusion

The knowledge on discharge information among patients with hypertensive disorders in pregnancy delivered at MNH was adequate. As observed from our study, most women were in the younger age group and primiparous, greater emphasis and a more tailored education must be given to these women due to high rate of recurrence of this condition in subsequent pregnancies.

5.2 Recommendations

- Regular training of healthcare providers in the area of improving discharge practices.
- More focused education on women of lower age groups (less than 20 years) since the knowledge amongst them was found to be inadequate.
- Development of a separate discharge forms for women with HDP that encompasses all the vital information tailored to their condition on postpartum danger signs, their diagnosis, details of their discharge medications and follow up plan.

REFERENCES

1. World Health Organization (WHO). Postnatal care of the mother and newborn 2013. World Heal Organ [Internet]. 2013;1–72. Available from: http://apps.who.int/iris/bitstream/10665/97603/1/9789241506649_eng.pdf
2. Preen DB, Bailey BES, Wright A, Kendall P, Phillips M, Hung J, et al. Effects of a multidisciplinary, post-discharge continuance of care intervention on quality of life, discharge satisfaction, and hospital length of stay: A randomized controlled trial. *Int J Qual Heal Care*. 2005;17(1):43–51.
3. Waisman Y, Siegal N, Chemo M, Siegal G, Amir L, Blachar Y, et al. Do parents understand emergency department discharge instructions? A survey analysis. *Isr Med Assoc J*. 2003;5(8):567–70.
4. Regalbuto R, Maurer MS, Chapel D, Mendez J, Shaffer JA. Joint Commission Requirements for Discharge Instructions in Patients With Heart Failure: Is Understanding Important for Preventing Readmissions? *J Card Fail* [Internet]. 2014;20(9):641–9. Available from: <http://dx.doi.org/10.1016/j.cardfail.2014.06.358>
5. Rhodes K V., Vieth T, He T, Miller A, Howes DS, Bailey O, et al. Resuscitating the physician-patient relationship: Emergency department communication in an academic medical center. *Ann Emerg Med*. 2004;44(3):262–7.
6. Franson KL, Dubois EA, De Kam ML, Burggraaf J, Cohen AF. Creating a culture of thoughtful prescribing. *Med Teach*. 2009;31(5):415–9.
7. Sheikh H, Brezar A, Dzwonek A, Yau L, Calder LA. Patient understanding of discharge instructions in the emergency department: do different patients need different approaches? *Int J Emerg Med*. 2018;11(1).

8. Narduzzi K. Discharge information and its relationship to quality of care and transition outcomes following short stay hysterectomy: a pilot study. Doctoral dissertation. Memorial University of Newfoundland; 2014.
9. Hutcheon JA, Lisonkova S, Joseph KS. Epidemiology of pre-eclampsia and the other hypertensive disorders of pregnancy. *Best Pract Res Clin Obstet Gynaecol* [Internet]. 2011;25(4):391–403. Available from: <http://dx.doi.org/10.1016/j.bpobgyn.2011.01.006>
10. Tanzania Ministry of Health. Tanzania Demographic and Health Survey Indicator Survey (TDHS-MIS) 2015-2016. Dar es Salaam, Tanzania, Rockville, Maryland, USA MoHCDGEC, MoH, NBS, OCGS, ICF. 2016;1(1):1–630.
11. Bwana VM, Id SFR, Mremi IR, Lyimo EP, Mboera LEG. Patterns and causes of hospital maternal mortality in. *PLoS One*. 2019;24(2006):1–22.
12. Li XF, Fortney JA, Kotelchuck M, Glover LH. The postpartum period: The key to maternal mortality. *Int J Gynecol Obstet*. 1996;54(1):1–10.
13. Noubiap J., Bigna J., Nyaga U., Jingi A., Kaze A., Nansseu J., et al. The burden of hypertensive disorders of pregnancy in Africa: a systematic review and meta-analysis. *J Clin Hypertens*. 2019;21(4):479–88.
14. Sageer R, Kongnyuy E, Adebimpe WO, Omosehin O, Ogunsola EA, Sanni B. Causes and contributory factors of maternal mortality: Evidence from maternal and perinatal death surveillance and response in Ogun state, Southwest Nigeria. *BMC Pregnancy Childbirth*. 2019;19(1):1–8.
15. Centers for Disease Control and Prevention. CDC VitalSigns: pregnancy-related deaths. Cent Dis Control Prev Website [Internet]. 2019; Available from: <https://www.cdc.gov/reproductive-health/maternal-infant-health/pregnancy-relatedmortality.htm>

16. World Health Organization. WHO. Health topics. Maternal Health [Internet]. 2017 [cited 2020 Jan 28]. Available from: http://www.who.int/topics/maternal_health/en/.
17. Povoas AM, Costa F, Rodrigues T, Patricio B, Cardoso F. Prevalence of hypertension during pregnancy in Portugal. *Hypertens Pregnancy*. 2008;27(3):279–84.
18. Berhan Y, Endeshaw G. Clinical and Biomarkers Difference in Prepartum and Postpartum Eclampsia. *Ethiop J Health Sci*. 2015;25(3):257–66.
19. Mahande MJ, Daltveit AK, Mmbaga BT, Masenga G, Obure J, Manongi R, et al. Recurrence of Preeclampsia in Northern Tanzania : A Registry-Based Cohort Study. 2013;8(11):1–9.
20. Hjartardottir S, Leifsson B, Geirsson R, Steinthorsdottir V. Recurrence of hypertensive disorder in second pregnancy. Vol. 194, *American Journal of Obstetrics and Gynecology*. 2006.
21. Anjali C, Chitashvili T, Harmida J, Karamagi E. Improving preeclampsia and eclampsia care tested changes and guidance from East Central Uganda. Kampala; 2018.
22. Koual M, Abbou H, Carbonnel M, Picone O, Ayoubi JM. Short-term outcome of patients with preeclampsia. *Vasc Health Risk Manag*. 2013;9:143–8.
23. Jarvie JL, Metz TD, Davis MB, Ehrig JC, Kao DP. Short-term risk of cardiovascular readmission following a hypertensive disorder of pregnancy. *Heart*. 2018;1:1187–94.
24. Shabani J, Todd G, Nswilla A. Maternal mortality in urban and rural Tanzania Social determinants and health system efficiency. 2018;(October).

25. Amenu G, Mulaw Z, Seyoum T, Bayu H. Knowledge about Danger Signs of Obstetric Complications and Associated Factors among Postnatal Mothers of Mechekel District Health Centers, East Gojjam Zone, Northwest Ethiopia, 2014. *Scientifica (Cairo)*. 2016;2016.
26. Dhaher E, Mikolajczyk RT, Maxwell AE, Krämer A. Factors associated with lack of postnatal care among Palestinian women: A cross-sectional study of three clinics in the West Bank. *BMC Pregnancy Childbirth*. 2008;8:1–9.
27. Okrainec K, Hahn-Goldberg S, Abrams H, Bell CM, Soong C, Hart M, et al. Patients' and caregivers' perspectives on factors that influence understanding of and adherence to hospital discharge instructions: a qualitative study. *C Open*. 2019;7(3):E478–83.
28. Mogos MF, Salemi JL, Spooner KK, McFarlin BL, Salihu HH. Hypertensive disorders of pregnancy and postpartum readmission in the United States: National surveillance of the revolving door. *J Hypertens*. 2018;36(3):608–18.
29. Engel KG, Buckley BA, Forth VE, McCarthy DM, Ellison EP, Schmidt MJ, et al. Patient understanding of emergency department discharge instructions: Where are knowledge deficits greatest? *Acad Emerg Med*. 2012;19(9):E1035–44.
30. TDHS. Tanzania 2015-16 Demographic Health Survey and Malaria Indicator Survey. Tanzania 2015-16 Demogr Heal Surv Malar Indic Surv. 2016;24.
31. Louis-Simonet M, Kossovsky MP, Sarasin FP, Chopard P, Gabriel V, Perneger T V., et al. Effects of a structured patient-centered discharge interview on patients' knowledge about their medications. *Am J Med*. 2004;117(8):563–8.

32. Bulut H, Tanrikulu G, Dal Ü, Kapucu S. How Much Do ED Patients Know About Medication Prescribed for Them on Discharge? A Pilot Study in Turkey. *J Emerg Nurs.* 2013;39(3):27–32.
33. Vilke GM, Marino A, Iskander J, Chan TC. Emergency department patient knowledge of medications. *J Emerg Med.* 2000;19(4):327–30.
34. Johnson A, Sandford J. Written and verbal information versus verbal information only for patients being discharged from acute hospital settings to home: Systematic review. *Health Educ Res.* 2005;20(4):423–9.
35. Ashbrook L, Mourad M, Sehgal N. Communicating discharge instructions to patients: A survey of nurse, intern, and hospitalist practices. *J Hosp Med.* 2013;8(1):36–41.
36. You WB, Wolf M, Bailey SC, Pandit AU, Waite KR, Sobel RM, et al. Factors associated with patient understanding of preeclampsia. *Hypertens Pregnancy.* 2012;31(3):341–9.
37. Bintabara D, Mohamed MA, Mghamba J, Wasswa P, Mpembeni RNM. Birth preparedness and complication readiness among recently delivered women in chamwino district, central Tanzania: A cross sectional study “Obstetrics.” *Reprod Health [Internet].* 2015;12(1):1–8. Available from: ???
38. Kabakyenga JK, Östergren PO, Turyakira E, Pettersson KO. Knowledge of obstetric danger signs and birth preparedness practices among women in rural Uganda. *Reprod Health.* 2011;8(1):1–10.
39. WHO, UNICEF, UNFPA, BANK W, UN. Trends in Maternal Mortality 2000 to 2017: Estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division. Geneva: World Health Organization. 2019. 1–119 p.

40. Spandorfer JM, Karras DJ, Hughes LA, Caputo C. Comprehension of Discharge Instructions by Patients in an Urban Emergency Department. *Ann Emerg Med.* 1995;25(1):71–4.
41. Engel KG, Buckley BA, Forth VE, McCarthy DM, Ellison EP, Schmidt MJ, et al. Patient understanding of emergency department discharge instructions: Where are knowledge deficits greatest? *Acad Emerg Med.* 2012;19(9):E1035–44.
42. Loscalzo DEHRCJ. 基因的改变NIH Public Access. *Bone.* 2011;23(1):1–7.
43. Bick D, Silverio SA, Bye A, Chang YS. Postnatal care following hypertensive disorders of pregnancy: a qualitative study of views and experiences of primary and secondary care clinicians. *BMJ Open.* 2020;10(1).
44. Hastings SN, Barrett A, Weinberger M, Oddone EZ, Ragsdale L, Hocker M, et al. Older patients' understanding of emergency department discharge information and its relationship with adverse outcomes. *J Patient Saf.* 2011;7(1):19–25.

APPENDICES

Appendix I: Consent Form English Version

STUDY TITLE: KNOWLEDGE ON DISCHARGE INFORMATION AMONG PATIENTS WITH HYPERTENSIVE DISORDERS IN PREGNANCY AT MUHIMBILI NATIONAL HOSPITAL.

Code No: _____

PART I: INFORMATION

Dear Participant

My name is Fatemazahra Amiji. I would like to invite you to participate in this research. I am conducting a study to assess the knowledge on discharge information among patients with hypertensive disorders in pregnancy at Muhimbili National Hospital.

Aim: This study aims to evaluate the knowledge on discharge information among patients with hypertensive disorders in pregnancy at Muhimbili National Hospital.

Participation: Principal investigator or research assistants will get information from you via face-to-face interviews. The interview will be done at the time of discharge just before you leave the hospital.

Confidentiality: All the information obtained will be kept confidential and they will only be used for the intended study aim. No write-up or publication of this study where your name or other identities will be displayed.

Right to withdrawal: Your participation in this study is voluntary and you may walk out of the study at any moment you desire after you have consented, and no penalty shall be imposed on you.

Benefits: There is no financial incentive upon your participation in this study. The findings of this study will help us determine the quality of verbal information given to patients with hypertensive disorders in pregnancy at the time of discharge.

Injury/Harm: The study will not in any way affect your plan of management for your condition. We do not expect any harm to you as a result of your participation in this study.

Who to contact: For any inquiry regarding this study please contact:

1. Dr. Fatemazahra Amiji, Principal Investigator.
Resident doctor in the Department of Obstetrics and Gynaecology at Muhimbili University of Health and Allied Sciences (MUHAS)
P.O Box 784, Dar es Salaam,
Mobile Number: +255719868193
E-mail address: xaara89@gmail.com
2. Dr. Sabria Rashid, Supervisor of the study.
Obstetrician and Gynecologist at Muhimbili National Hospital
Mobile Number: +255713210880
E-mail address: sabriarashid@yahoo.com
3. Dr. Bruno Sunguya, the Director of MUHAS Senate Research and Publication Committee.
P. O. Box: 65001, Dar es Salaam.
Phone Number: +255 222 150302-6

PART II: CERTIFICATE OF CONSENT

I, _____ have read the above information/it has been read to me.
I have had the opportunity to ask questions about it and any questions I asked have been answered to my satisfaction. I consent voluntarily to be a participant in this study.

Signature of the participant _____

Signature of researcher _____

Date of signed consent _____

Appendix II: Consent Form Swahili Version

RIDHAA YA KUSHIRIKI KATIKA UTAFITI: UFAHAMU WA MAELEKEZO KWA WAGONJWA WA PRESHA YA MIMBA WANAORUHUSIWA KUTOKA HOSPITALI YA MNH KWENDA NYUMBANI

Namba Ya Utambulisho:

SEHEMU YA I: TAARIFA

Ndugu Mshiriki,

Naitwa Dkt Fatemazahra Amiji. Napenda kukushukuru kwa kushiriki kwenye mahojiano haya. Ninafanya utafiti ili kuangalia kasi ya ufahamu wa maelekezo ya mdomo kwa wagonjwa wa presha ya mimba wanaoruhusiwa kutoka hospitali ya MNH kwenda nyumbani.

Lengo: Kuangalia kasi ya ufahamu wa maelekezo ya mdomo kwa wagonjwa wa presha ya mimba wanaoruhusiwa kutoka hospitali kwenda nyumbani.

Ushiriki: Mtafiti mkuu/msaidizi atakuuliza maswali mbalimbali kuhusu maelekezo uliopata kabla ya kuruhusiwa kwenda nyumbani.

Usiri: Taarifa zote zitakazo patikana zitahifadhiwa kwa usiri na zitatumika kwa ajili ya lengo la utafiti tu. Jina lako au utambulisho wako hautatokea kwenye maandishi au machapisho yoyote ya utafiti huu.

Haki ya kujitoa: Ushiriki wako kwenye utafiti huu ni wa hiari na unaweza kujitoa kwenye utafiti huu wakati wowote baadaya kukubali, hakuna adhabu yoyote itakayotozwa juu yako.

Faida: Hakuna motisha ya kifedha juu ya ushiriki wako kwenye utafiti huu; hata hivyo ushiriki wako ni muhimu katika kutimiza lengo la utafiti huu kwa kuwa utafiti huu utasaidia kujua ubora wa maelekezo ya mdomo kwa wagonjwa wa presha ya mimba wanaoruhusiwa kutoka hospitali kwenda nyumbani.

Kuumia/Madhara: Utafiti huu hauta athiri upatikanaji huduma za kiafya kwako. Hatutarajii madhara yoyote kwako, au kwa familia yako, au kwa wasaidizi wako kutokana na ushiriki wako katika utafiti huu.

Kwa mawasiliano: Endapo utakua na swali lolote linalo husu utafiti huu, wasiliana na wafuatao:

1. Dkt Fatemazahra Amiji, Mtafiti Mkuu,
Daktari, Idara ya Magonjwa ya Akina mama na Wanawake,
Chuo Kikuu cha Afya na Sayansi Shirikishi Muhimbili,
S.L.P. 784, Dar es Salaam.
Simu +255719868193
Barua Pepe: xaara89@gmail.com
2. Dkt. Sabria Rashid, Msimamizi Mkuu,
Daktari, ya Magonjwa ya Akina mama na Wanawake,
Simu: +255713210880
Barua Pepe: sabriarashid@yahoo.com
3. Dkt. Bruno Sunguya, Mwenyekiti Kamati ya Utafiti
S.L.P: 65001, Dar es Salaam.
Simu: +255 222 150302-6

SEHEMU YA II: CHETI CHA RIDHAA

Miminimesoma (nimesomewa) taarifa hii kama ilivyoelezwa hapo juu. Nimepata nafasi ya kuuliza maswali na nimejibiwa na nimeridhika. Nimeelewa dhumuni la utafiti huu. Ninakubali/ninaridhia kwa hiari yangu kushiriki katika utafiti huu.

Sahihi ya mtoa huduma za afya _____

Sahihi ya mtafiti _____

Tarehe _____

Appendix III: Data Collection Tool (English Version)

This questionnaire is meant to collect information about you and your experience as a patient. This will prove important feedback which will help us to improve the standard of care. Your response will be purely confidential. Kindly respond honestly. Thank you for your cooperation.

Part 1: SOCIODEMOGRAPHIC DATA AND OBSTETRICS CHARACTERISTICS

Age:
Marital status: 1. Single _____ 2. Married _____ 3. Divorced _____ 4. Cohabiting _____ 5. Widowed _____
Level of education: 1. No formal education _____ 2. Primary education completed _____ 3. Primary education not completed _____ 4. Secondary education _____ 5. Higher education _____
Level of education of spouse/partner: 1. No formal education _____ 2. Primary education completed _____ 3. Primary education not completed _____ 4. Secondary education _____ 5. Higher education _____

<p>Area of Residence:</p> <ol style="list-style-type: none">1. Urban _____2. Rural _____
<p>Employment status:</p> <ol style="list-style-type: none">1. Employed _____2. Unemployed _____3. Self-employed _____4. Petty trader _____5. Housewife _____
<p>Employment status of spouse</p> <ol style="list-style-type: none">1. Employed _____2. Self employed _____3. Unemployed _____4. Petty trader _____
<p>Parity: _____</p>
<p>History of hypertension in previous pregnancy/pregnancies?</p> <ol style="list-style-type: none">1. Yes _____2. No _____
<p>If the answer to the above is yes, use of anti-hypertensive</p> <ol style="list-style-type: none">1. Yes _____2. No _____
<p>History of complication during prior pregnancy, labor or post-delivery?</p> <ol style="list-style-type: none">1. Yes _____2. No _____

<p>If yes, what was the complication?</p> <ul style="list-style-type: none">a) Antepartum or postpartum hemorrhage _____b) Infectious disease such as HIV or Hepatitis B _____c) Obstructed Labor _____d) Abortion _____e) Other: _____
<p>Total number of ANC visits during index pregnancy:</p> <ul style="list-style-type: none">1. One time _____2. Two times _____3. Three times _____4. Four or more times _____
<p>Gestational Age at first antenatal booking:</p> <ul style="list-style-type: none">1. Before 4th month _____2. Within 4th-5th month _____3. Within 6th-7th month _____4. Within 8th month and after _____5. Do not know _____
<p>Escorted by partner/husband to ANC visits:</p> <ul style="list-style-type: none">1. Yes _____2. No _____
<p>Mode of Delivery:</p> <ul style="list-style-type: none">1. SVD _____2. Cesarean Section _____3. Assisted Vaginal Delivery (Vacuum/breech) _____
<p>Condition of neonate at discharge:</p> <ul style="list-style-type: none">1. Normal/Alive _____2. Dead _____

Part 2: DATA ON DANGER SIGNS

1. Do you know of the danger signs associated with high blood pressure? YES / NO
2. If YES, can you mention them?

Which of the following danger signs is the patient aware of?	Tick the ones mentioned
1. Severe headache	
2. Fits/Convulsions	
3. Blurry vision	
4. Pain in the belly, especially the right upper area below your ribs	
5. Worsening of swelling of the legs, arms or whole body	
6. Difficulty breathing	
7. Loss of consciousness	

Part 3: DATA ON DIAGNOSIS

1. Do you know your diagnosis: YES / NO
2. Mention your diagnosis: _____

PART 4: DATA ON MEDICATIONS:

1. Were you prescribed with any medications today? YES / NO
2. IF YES,
 - a. Do you know the name of the medication? YES / NO
 - b. Do you know the dosage of the medication? YES / NO
 - c. Do you know the frequency of taking the medication? YES / NO
 - d. Do you know the purpose of the medication? YES / NO
 - e. Do you know the duration of taking the medication? YES / NO

PART 5: DATA ON FOLLOW-UP PLAN

1. Do you think it is important to return for follow-up visit after discharge? YES / NO
2. Have you been told to return for follow up visit? YES / NO
3. If yes,
 - a. Do you know the date of follow up visit? YES / NO
 - b. Do you know the place of follow up visit? YES / NO
 - c. Do know the purpose of the follow up visit? YES / NO

Appendix IV: Data Collection Tool (Swahili Version)

Dodoso hili limelenga kukusanya maelekezo yako kama mgonjwa kuhusu ufahamu wako katika mada tajwa hapo juu. Maelezo hayo yatatoa taarifa muhimu ambazo zitatumika kufanya maboresho katika utoaji wa huduma za afya ya uzazi. Majibu yako yatawekwa katika hali ya usiri mkubwa. Tafadhali jibu maswali yote kwa uadilifu. Natoa shukrani kwa ushirikiano uiotupatia.

TOOL NUMBER: _____

WARD: _____

Umri: _____
<p>Hali ya ndoa</p> <ol style="list-style-type: none"> 1. Sijaolewa _____ 2. Nimeolewa _____ 3. Tumeachana _____ 4. Tunaishi Pamoja _____ 5. Mjane _____
<p>Kiwango cha elimu:</p> <ol style="list-style-type: none"> 1. Elimu ya msingi sijamaliza _____ 2. Elimu ya msingi nimemaliza _____ 3. Elimu ya sekondari _____ 4. Elimu ya juu _____ 5. Sijasoma _____
<p>Kiwango cha elimu cha mume wako:</p> <ol style="list-style-type: none"> 1. Elimu ya msingi hajamaliza _____ 2. Elimu ya msingi amemaliza _____ 3. Elimu ya sekondari _____ 4. Elimu ya juu _____ 5. Hajasoma _____

<p>Sehemu unapoishi:</p> <ol style="list-style-type: none"> 1. Mjini _____ 2. Kijijini _____
<p>Hali ya ajira:</p> <ol style="list-style-type: none"> 1. Nimeajiriwa _____ 2. Sijaajiriwa _____ 3. Nimejiajiri _____ 4. Mke wa nyumbani _____ 5. Nina biashara ndogo ndogo _____
<p>Hali ya ajira ya mume wako:</p> <ol style="list-style-type: none"> 1. Amejiriwa _____ 2. Hajaajiriwa _____ 3. Amejiajiri _____ 4. Ana biashara ndogo ndogo _____
<p>Umejifungua mara ngapi: _____</p>
<p>Historia ya shinikizo la juu la damu/presha katika mimba iliyopita/zilizopita?</p> <ol style="list-style-type: none"> 1. Ndio _____ 2. Hapana _____
<p>Kama jibu la hapo juu ni ndio, umetumia dawa za shinikizo la juu la damu/presha?</p> <ol style="list-style-type: none"> 1. Ndio _____ 2. Hapana _____
<p>Historia ya matatizo ya uzazi kabla ya kujifungua, wakati wa kujifungua au baada ya kujifungua?</p> <ol style="list-style-type: none"> 1. Ndio _____ 2. Hapana _____

Kama ndio, ulipata matatizo gani?

- a) Kutokwa na damu nyingi kabla au baada ya kujifungua _____
- b) Maambukizi kwenye damu au kizazi _____
- c) Uchungu pingamizi _____
- d) Mimba kuharibika _____
- e) Nyingine: _____

Idadi la hudhurio ya kliniki ya ujauzito katika mimba hii:

1. Mara moja _____
2. Mara mbili _____
3. Mara tatu _____
4. Mara nne au Zaidi _____

Umri wa mimba katika hudhurio ya kwanza ya kliniki ya ujauzito katika mimba hii:

1. Kabla miezi minne _____
2. Kati ya miezi minne mpaka mitano _____
3. Kati ya miezi sita na saba _____
4. Kati ya miezi nane na kuendelea _____
5. Sikumbuki _____

Ulisindikizwa na mume au mwenza wako katika hudhurio la kliniki?

1. Ndio _____
2. Hapana _____

Umejifungua kwa njia gani?

1. Kawaida _____
2. Njia ya upasuaje _____
3. Njia ya usaidizi (Vacuum) _____

Hali ya mtoto wakati wa kujifungua:

1. Hai _____
2. Amekufa _____

SEHEMU II: UFAHAMU WA DALILI ZA HATARI

1. Je, unafahamu dalili za hatari ya shinikizo la juu la damu? NDIO / HAPANA
2. Kama NDIO, unaweza kuzitaja?

Dalili	Weka tick ambazo anazitaja
1. Maumivu mabaya/makali ya kichwa	
2. Degedege	
3. Maumivu ya tumbo au chini ya mbavu za kulia	
4. Maruweruwe au kuona kitu mara mbili	
5. Miguu na mikono au mwili nzima kuvimba	
6. Shida ya kupumua	
7. Kupoteza fahamu	

SEHEMU III: UFAHAMU WA UTAMBUZI

1. Je, unafahamu utambuzi wako? NDIO / HAPANA
2. Kama Ndio, Taja utambuzi wako: _____

SEHEMU IV: UFAHAMU WA MADAWA:

1. Je, umepewa dawa yoyote leo? NDIO / HAPANA
2. Kama NDIO,
 - a. Unafahamu jina la dawa uliopewa za kwenda kutumia ukiwa umetoka hospitali? NDIO / HAPANA
 - b. Unafahamu kiwango cha dawa hiyo? NDIO / HAPANA
 - c. Unajua unafaa kuitumia mara ngapi kwa siku? NDIO / HAPANA
 - d. Unafahamu lengo na madhumuni ya dawa hiyo? NDIO / HAPANA
 - e. Unafahamu unafaa kuitumia hiyo dawa kwa mda gani? NDIO / HAPANA

SEHEMU V: UFAHAMU WA MAHUDHURIO BAADA YA KURUHUSIWA

1. Unaona kuna umuhimu wa mahudhurio baada ya kuruhusiwa kwenda nyumbani?
NDIO / HAPANA
2. Je, umepewa taarifa au tarehe ya hudhurio lijalo? NDIO / HAPANA
3. Kama NDIO,
 - a. Unajua ni tarehe ngapi? NDIO / HAPANA
 - b. Unafahamu ni mahali gani? NDIO / HAPANA
 - c. Unajua madhumuni ya hudhurio hilo? NDIO / HAPANA